

# **Mark Hollins**

## Curriculum Vitae

June 2009

### Contact Information

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### Education

Florida State University, Tallahassee, Florida: B.A. (Psychology), 1966  
Brown University, Providence, Rhode Island: M.Sc. (Psychology), 1969  
Brown University, Providence, Rhode Island: Ph.D. (Psychology), 1971

### Positions Held

NSF Postdoctoral Fellow, University of Michigan, Ann Arbor, 1970-1971  
Research Fellow, Brown University, 1971-1973  
Assistant Professor of Psychology, UNC-Chapel Hill, 1973-1978  
Associate Professor of Psychology, UNC-Chapel Hill, 1979-1990  
Professor of Psychology, UNC-Chapel Hill, 1990-present  
Adjunct Professor of Endodontics, 1998-present  
Member, Neurobiology Curriculum, 1992-present

### Awards

Distinguished Teaching Award for Post-Baccalaureate Instruction (2007), UNC-Chapel Hill  
Wilson Family Honors Course Development Award (2007).

### Professional Affiliations

American Pain Society  
American Psychological Association (Fellow, Division 3)

International Association for the Study of Pain  
Psychonomic Society  
Tactile Research Group

## Service

### *Advisory/Review Panels*

Member, Editorial Advisory Board, *Sage Encyclopedia of Perception* (2008-present)

Member, Peer Review Panel, *Journal of Visual Impairment & Blindness* (2006-present)

### *Reviewer for:*

Association for Computing Machinery (ACM) Transactions on Applied Perception; Attention, Perception, & Psychophysics (most recent review, 2009); Behavioural Brain Research; Experimental Brain Research; IEEE Transactions on Haptics; Journal of Experimental Psychology: Learning, Memory, and Cognition; Journal of Neuroscience; Neuroscience & Biobehavioral Reviews; Perception (2009); Psychonomic Bulletin & Review; Quarterly Journal of Experimental Psychology (2009); Somatosensory and Motor Research

### *Campus Activities*

Chair, Academic Affairs Institutional Review Board, 1989-1992; Member, University Hearings Board, 1987-1997; Member, Society of Fellows Faculty Board, 1996(year of founding)-2002; Member, Advisory Board of the Cognitive Science Program, 1998-2000

### *Department Activities*

Director of Graduate Studies, 1995-present

Chair, Graduate Education Committee, 1995-present

Member, Personnel Committee

Member, Instructional Committee

Member, Lecturer Search Committee, 2005-2008

Chair, Lecturer Search Committee, 2008-present

Member, Lecturer Review Committee, 2007-present

Member, Student Services Manager Search Committee, 2007-2008

Member, Space Committee, 2006-2008

Member, Program Review Committee (2008-present)

Member, recent Dissertation Committees (partial list): Jeremy Day (2009),

Bradford Fischer (2008), Sarah Hart (2007), Steven Heymen (2007),

Luv Kohli (Computer Science; current), Lisa Lomas (2007), Beth

Mechlin (2009), Laurence Miller (current), Greg Stonerock (current),  
Jolan Turner (2005), Vicki West (2007)

## Publications

Hollins, M. (In press). Somesthetic senses. *Annual Review of Psychology*, 61 [scheduled for publication in 2010].

Yau, J. M., Hollins, M., & Bensmaïa, S. J. (In press). Textural timbre: the perception of surface microtexture depends in part on multimodal spectral cues. *Communicative and Integrative Biology*.

Hollins, M., Harper, D., Gallagher, S., Owings, E. W., Lim, P. F., Miller, V., Siddiqi, M. Q., & Maixner, W. (2009). Perceived intensity and unpleasantness of cutaneous and auditory stimuli: An evaluation of the generalized hypervigilance hypothesis. *Pain*, 141, 215-221.

Hollins, M. (In press). Multimodal interactions: Pain-touch. In *Encyclopedia of Perception*. Thousand Oaks, CA: Sage Publications.

Hollins, M. (In press). Texture perception: Tactile. In *Encyclopedia of Perception*. Thousand Oaks, CA: Sage Publications.

Hollins, M., & Bensmaïa, S. J. (2007). The coding of roughness. *Canadian Journal of Experimental Psychology*, 61, 184-195.

Hollins, M., Lorenz, F., & Harper, D. (2006). Somatosensory coding of roughness: The effect of texture adaptation in direct and indirect touch. *Journal of Neuroscience*, 26, 5582-5588.

Higashiyama, A., Hollins, M., & Maixner, W. (2006). Tactile orientation constancy: Do proprioception and attention affect the tactile vertical? *Japanese Psychological Research*, 48, 255-269.

Hollins, M., Lorenz, F., Seeger, A., & Taylor, R. (2005). Factors contributing to the integration of textural qualities: Evidence from virtual surfaces. *Somatosensory & Motor Research*, 22, 193-206.

Tommerdahl, M., Hester, K. D., Felix, E. R., Hollins, M., Favorov, O. V., Quibrera, P. M., & Whitsel, B. L. (2005). Human vibrotactile frequency discriminative capacity after adaptation to 25Hz or 200Hz stimulation. *Brain Research*, 1057, 1-9.

Bensmaïa, S. J., & Hollins, M. (2005). Pacinian representations of fine surface texture. *Perception & Psychophysics*, 67, 842-854.

- Bensmaïa, S. J., Hollins, M., & Yau, J. (2005). Vibrotactile information in the Pacinian system: a psychophysical model. *Perception & Psychophysics*, *67*, 828-841.
- Hollins, M., Seeger, A., Pelli, G., & Taylor, R. (2004). Haptic perception of virtual surfaces: Scaling subjective qualities and interstimulus differences. *Perception*, *33*, 1001-1019.
- Hollins, M., Roy, E. A., & Crane, S. A. (2003). Vibratory antinociception: Effects of vibration amplitude and frequency. *The Journal of Pain*, *4*, 381-391.
- Roy, E. A., Hollins, M., & Maixner, W. (2003). Reduction of TMD pain by high-frequency vibration: a spatial and temporal analysis. *Pain*, *101*, 267-274.
- Bensmaïa, S. J., & Hollins, M. (2003). The vibrations of texture. *Somatosensory & Motor Research*, *20*, 33-43.
- Hollins, M. (2002). Touch and haptics. In Pashler, H. (Editor-in-chief), & Yantis, S. (Volume Editor), *Stevens' handbook of experimental psychology, Third edition, Vol. 1* (pp. 585-618). New York, NY: John Wiley & Sons.
- Hollins, M., Bensmaïa, S. J., & Roy, E. A. (2002). Vibrotaction and texture perception. *Behavioural Brain Research*, *135*, 51-56.
- Hollins, M., Bensmaïa, S. J., & Washburn, S. (2001). Vibrotactile adaptation impairs discrimination of fine, but not coarse, textures. *Somatosensory & Motor Research*, *18*, 253-262.
- Hollins, M., Fox, A., & Bishop, C. (2000). Imposed vibration influences perceived tactile smoothness. *Perception*, *29*, 1455-1465.
- Hollins, M., Sigurdsson, A., & Morris, K. A. (2001). Local vibrotactile and pain sensitivities are negatively related in temporomandibular disorders. *The Journal of Pain*, *2*, 46-56.
- Hollins, M., Bensmaïa, S., Karlof, K., & Young, F. (2000). Individual differences in perceptual space for tactile textures: Evidence from multidimensional scaling. *Perception & Psychophysics*, *62*, 1534-1544.
- Bensmaïa, S. J., & Hollins, M. (2000). Complex tactile waveform discrimination. *Journal of the Acoustical Society of America*, *108*, 1236-1245.
- Hollins, M. (2000). Vision impairment and cognition. In B. Silverstone, M. A. Lang, B. P. Rosenthal & E. E. Faye (Eds.-in-chief), *The Lighthouse handbook*

- on vision impairment and vision rehabilitation. Vol. 1. Vision impairment* (pp. 339-358). New York: Oxford University Press.
- Hollins, M., & Risner, S. R. (2000). Evidence for the duplex theory of tactile texture perception. *Perception & Psychophysics*, *62*, 695-705.
- Fillingham, R. B., Fillingham, L. A., Hollins, M., Sigurdsson, A., & Maixner, W. (1998). Generalized vibrotactile allodynia in a patient with temporomandibular disorder. *Pain*, *78*, 75-78.
- Roy, E. A., & Hollins, M. (1998). A ratio code for vibrotactile pitch. *Somatosensory and Motor Research*, *15*, 134-145.
- Hollins, M., & Sigurdsson, A. (1998). Vibrotactile amplitude and frequency discrimination in temporomandibular disorders. *Pain*, *75*, 59-67.
- Hollins, M., and Roy, E. A. (1996). Perceived intensity of vibrotactile stimuli: The role of mechanoreceptive channels. *Somatosensory and Motor Research*, *13*, 273-286.
- Hollins, M., Sigurdsson, A., Fillingham, L., and Goble, A. K. (1996). Vibrotactile threshold is elevated in temporomandibular disorders. *Pain*, *67*, 89-96.
- Hollins, M., Delemos, K. A., and Goble, A. K. (1996). Vibrotactile adaptation of the RA system: A psychophysical analysis. In O. Franzén, R. Johansson, and L. Terenius (Eds.), *Somesthesia and the neurobiology of the somatosensory cortex* (pp. 101-111). Basel: Birkhäuser Verlag.
- Delemos, K. A., and Hollins, M. (1996). Adaptation-induced enhancement of vibrotactile amplitude discrimination: The role of adapting frequency. *Journal of the Acoustical Society of America*, *99*, 508-516.
- Goble, A. K., and Hollins, M. (1994). Vibrotactile adaptation enhances frequency discrimination. *Journal of the Acoustical Society of America*, *96*, 771-780.
- Hollins, M. and Favorov, O. (1994). The tactile movement aftereffect. *Somatosensory and Motor Research*, *11*, 153-162.
- Hollins, M., Faldowski, R., Rao, S., and Young, F. (1993). Perceptual dimensions of tactile surfaced texture: A multidimensional scaling analysis. *Perception & Psychophysics*, *54*, 697-705.
- Goble, A. K., and Hollins, M. (1993). Vibrotactile adaptation enhances amplitude discrimination. *Journal of the Acoustical Society of America*, *93*, 418-424.

- Hollins, M., Delemos, K. A., and Goble, A. K. (1991). Vibrotactile adaptation on the face. *Perception & Psychophysics*, *44*, 21-30.
- Hollins, M., Goble, A. K., Whitsel, B. L. and Tommerdahl, M. (1990). Time course and action spectrum of vibrotactile adaptation. *Somatosensory and Motor Research*, *7*, 205-221.
- Hollins, M. (1989). *Understanding blindness: An integrative approach*. Hillsdale, NJ: Erlbaum.
- Hollins, M., and Goble, A. K. (1988). Perception of the length of voluntary movements. *Somatosensory Research*, *5*, 335-348.
- Hollins, M., and Kelley, E. K. (1988). Spatial updating in blind and sighted people. *Perception & Psychophysics*, *43*, 380-388.
- Whitsel, B. L., Franzén, O., Dreyer, D. A., Hollins, M., Young, M., Essick, G. K. and Wong, C. (1986). Dependence of subjective traverse length on velocity of moving tactile stimuli. *Somatosensory Research*, *3*, 185-196.
- Hollins, M. (1986). Haptic mental rotation: More consistent in blind subjects? *Journal of Visual Impairment and Blindness*, *80*, 950-952.
- Hollins, M. (1985). Styles of mental imagery in blind adults. *Neuropsychologia*, *23*, 561-566.
- Hollins, M. (1985). Taste as perception. *Currents: The Journal of Food, Nutrition & Health*, *1*, 14-17.
- Rogers, D. C., and Hollins, M. (1982). Is the binocular rivalry mechanism tritanopic? *Vision Research* *22*, 515-520.
- Hollins, M., and Bailey, G. W. (1981). Rivalry target luminance does not affect suppression depth. *Perception & Psychophysics*, *30*, 201-203.
- Glickstein, M., Cohen, J. L., Dixon, B., Gibson, A., Hollins, M., LaBossiere, E. and Robinson, F. (1980). Corticopontine visual projections in macaque monkeys. *Journal of Comparative Neurology*, *190*, 209-229.
- Hollins, M., and Hudnell, K. (1980). Adaptation of the binocular rivalry mechanism. *Investigative Ophthalmology and Visual Science*, *19*, 1117-1120.
- Hollins, M. (1980). The effect of contrast on the completeness of binocular rivalry suppression. *Perception & Psychophysics*, *27*, 550-556.

- Whitsel, B. L., Dreyer, D. A., Hollins, M., and Young, M. G. (1980). The coding of direction of tactile stimulus movement: Correlative psychophysical and electrophysiological data. In D. R. Kenshalo (Ed.), *Sensory functions of the skin of humans* (pp. 79-107). New York: Plenum.
- Hollins, M. (1979). Sensation and perception: An informal approach. *Contemporary Psychology, 24*, 225-226 [review of *Introduction to Sensory Processes*].
- Hollins, M. and Leung, E. H. L. (1978). The influence of color on binocular rivalry. In J. C. Armington, J. Krauskopf and B. R. Wooten (Eds.), *Visual psychophysics and physiology. A volume dedicated to Lorrin Riggs* (pp. 181-190). New York: Academic Press.
- Whitsel, B. L., Dreyer, D. A. and Hollins, M. (1978). Representation of moving stimuli by somatosensory neurons. *Federation Proceedings, 37*, 2223-2227.
- Dreyer, D. A., Hollins, M., and Whitsel, B. L. (1978). Factors influencing cutaneous directional sensitivity. *Sensory Processes, 2*, 71-79.
- Hollins, M. and Bunn, K. W. (1977). The relation between convergence micropsia and retinal eccentricity. *Vision Research, 17*, 403-408.
- Hollins, M. (1976). Does accommodative micropsia exist? *American Journal of Psychology, 89*, 443-454.
- Hollins, M. (1974). Does the central retina stretch during accommodation? *Nature, 251*, 729-730.
- Hollins, M., and Alpern, M. (1973). Dark adaptation and pigment regeneration in human cones. *Journal of General Physiology, 62*, 430-447.
- Hollins, M., and Montabana, D. J. (1973). Spectral sensitivity of the foveal blue-sensitive mechanism determined by color mixture. *Vision Research, 13*, 1391-1393.
- Hollins, M. (1971). Brightness contrast at low luminances. *Vision Research, 11*, 1459-1472.

### Presentations/Abstracts

- Hollins, M., Harper, D., & Gallagher, S. (2009). Does gradual sensitization block vibrotactile pain gating? Poster to be presented at the annual meeting of the American Pain Society, San Diego. May 7-9. [*Journal of Pain, 10* (4), Supplement 1, S31.]

- Hollins, M. (2008). Sensory coding and interaction in touch and pain. In New Fellows symposium—Part 1: Perception and cognition. Paper presented at the 116<sup>th</sup> Convention of the American Psychological Association, Boston. August 14-17.
- Nebel, N.B., Folger, S., Hollins, M., & Essick, G. (2008). fMRI brain representation of non-facial tactile stimulation in TMD. Poster presented at the 86th General Session and Exhibition of the International Association for Dental Research, Toronto, Canada. July 2-5.
- Hollins, M. (2008). Stages of pain processing: A psychophysical analysis. Invited talk at the Duke University Center for Cognitive Neuroscience. April 10.
- Hollins, M., Harper, D. E., Gallagher, S. M., & Maixner, W. (2007). Hypervigilance does not increase the loudness of unpleasant sounds. Paper presented at the 48<sup>th</sup> Annual Meeting of the Psychonomic Society, Long Beach CA, November 15-18. [*Abstracts of the Psychonomic Society, 12, 35.*]
- Hollins, M., & Lorenz, F. M. (2005). Adaptation to textured surfaces: A comparison of direct and indirect touch. Paper presented at the 46<sup>th</sup> Annual Meeting of the Psychonomic Society, Toronto, November 10-13. [*Abstracts of the Psychonomic Society, 10, 20.*]
- Hollins, M. (2005). Perceptual qualities of surfaces: Is stickiness special? Paper presented at the *Softness and Smoothness Workshop* sponsored by Unilever Corporation, Weehawken, NJ, June 1-2.
- Hollins, M. (2003). Graduate seminar presented in the Department of Electrical and Computer Engineering, Purdue University (West Lafayette, IN), Oct 23.
- Bensmaïa, S., Hollins, M. & Yau, J. (2003). The Pacinian system and the discrimination of high-frequency complex tactile waveforms: A neural model. Poster presented at the annual North Carolina Cognition Conference, Durham, February.
- Hollins, M., Roy, E. A., & Crane, S. A. (2002). Vibration affects sensitivity to a noxious stimulus. Paper presented at the annual meeting of the Tactile Research Group, Kansas City, MO, Nov 21.
- Bensmaïa, S. J., Hollins, M., & Johnson, M. L. (2000). The vibrations of texture. Paper presented (by S. J. Bensmaïa) at the annual meeting of the Tactile Research Group, New Orleans, November 16.
- Hollins, M., & Bensmaïa, S. J. (2000). Vibrotactile adaptation impairs discrimination of fine textures. Paper presented at the 41<sup>st</sup> Annual Meeting of

the Psychonomic Society, New Orleans, November 16-19. [*Abstracts of the Psychonomic Society*, 5, 17.]

- Seeger, A., Henderson, A., Pelli, G. L., Hollins, M., & Taylor, R. M., II. (2000). Haptic display of multiple scalar fields on a surface. Paper presented (by A. Seeger) at Conference on Information and Knowledge Management (CIKM) Workshop on New Paradigms in Information Visualization and Manipulation, Vienna, VA, November 10.
- Roy, E.A., Hollins, M., Crane, S.A., & Maixner, W. (2000). Both High and Low Vibration Frequencies Reduce Tonic Pain. Poster presented at the 1<sup>st</sup> Annual Southeastern Academic Pain Symposium, *Pain Related Suffering*, Durham, NC, October 20-22.
- Hollins, M., Pelli, G. L., Seeger, A., & Taylor, R. M., II. (2000). Perceptual space for texture dimensions: What is the metric? Paper presented (by G. L. Pelli) at the 2nd Phantom Users Research Symposium (PURS 2000), Zurich, Switzerland, July 6-7 (<http://www.vision.ee.ethz.ch/~purs2000/>).
- Roy, E. A., Maixner, W., & Hollins, M. (1999). Effects of Vibration on Pain Associated with TMD. Poster presented at the 18<sup>th</sup> Annual Meeting of the American Pain Society, Fort Lauderdale, October 21-24.
- Hollins, M. (1999). "Experimental Analysis of Vibrotactile Analgesia," talk given at the Tactile Research Group, Los Angeles, November 18, 1999.
- Hollins, M. (1999). Vibrotaction and Texture Perception. Talk given at the International Symposium on Brain Mechanisms of Tactile Perception, Stockholm, October 11-13.
- Roy, E. A., Maixner, W., & Hollins, M. (1999). Effects of vibration on pain associated with TMD. Poster presented at the 18<sup>th</sup> Annual Scientific Meeting of the American Pain Society, Fort Lauderdale, October 21-24, 1999.
- Hollins, M., Bensmaïa, S., & Risner, R. (1998). The duplex theory of tactile texture perception. In Grondin, S., & Lacouture, Y. (Eds.), *Fechner Day 98. Proceedings of the Fourteenth Annual Meeting of the International Society for Psychophysics* (pp. 115-120). Québec, Canada: The International Society for Psychophysics.
- Hollins, M. (1997). Overview of tactile sensibility. Presentation at *Somatosensation and the Underlying Neural Mechanisms* conference, November 13-15, Chapel Hill, NC.
- Hollins, M., and Roy, E. A. (1996). Channel contributions to perceived intensity of vibrotactile stimuli. *Abstracts of the Psychonomic Society*, 1, 74.

- Roy, E. A., and Hollins, M. (1996). A model of vibrotactile loudness. *Journal of Mathematical Psychology*, 40, 350. Paper presented at the 29<sup>th</sup> annual meeting of the Society for Mathematical Psychology, University of North Carolina at Chapel Hill, August 1-4.
- Hollins, M., Fillingim, L. A., and Goble, A. K. (1994). Vibrotactile threshold and TMD. *Program of the 35th Annual Meeting of the Psychonomic Society*, p. 4.
- Hollins, M., Delemos, K. A., and Goble, A. K. (1994). Vibrotactile adaptation as an analytical tool. Paper presented at the International Symposium on Somesthesia and the Neurobiology of the Somatosensory Cortex, Stockholm, Sweden, August 29-31.
- Goble, A. K., and Hollins, M. (1993). Vibrotactile adaptation enhances frequency discrimination. *Bulletin of the Psychonomic Society*, 31, 356.
- Hollins, M. (1992). A tactile movement aftereffect. *Bulletin of the Psychonomic Society*, 30, 446.
- Hollins, M., Goble, A. K., and Delemos, K. A. (1991). Vibrotactile adaptation. *Journal of the Acoustical Society of America*, 89, 2002.
- Hollins, M., Goble, A. K., Delemos, K. A., and Whitsel, B. L. (1989). Time course of vibrotactile adaptation on two body sites. *Bulletin of the Psychonomic Society*, 27, 499.
- Hollins, M., and Goble, A. K. (1988). Pointing to previously seen or touched objects. *Bulletin of the Psychonomic Society*, 26, 487.
- Hollins, M., and Goble, A. K. (1987). The perception of walked distance. *Bulletin of the Psychonomic Society*, 25, 338.
- Hollins, M., Pick, D. F., and Mumaw, R. (1986). Changes in hand orientation during haptic mental rotation. *Bulletin of the Psychonomic Society*, 24, 346.
- Hollins, M., and Kelley, E. K. (1985). Knowledge of layout in congenitally blind subjects. *Bulletin of the Psychonomic Society*, 23, 278.
- Hudnell, H. K., and Hollins, M. (1985). The influence of saccadic eye movements on binocular rivalry. *Investigative Ophthalmology and Visual Science*, 25, Supplement, p. 241.
- Rogers, D. C., and Hollins, M. (1981). Color does not influence binocular rivalry for red-green dichromats. *Investigative Ophthalmology and Visual Science*, 20, Supplement, p. 225.

Hudnell, H. K., and Hollins, M. (1979). Fatigue of the suppression mechanism following prolonged binocular rivalry. *Investigative Ophthalmology and Visual Science*, Supplement, p. 173.

Dreyer, D. A., Hollins, M., Whitsel, B. L., and Young, M. (1978). Velocity dependence of a dimension of cutaneous sensibility. *Society for Neuroscience Abstracts*, 4, 550.

Dreyer, D. A., Hollins, M., Whitsel, B. L., and Allen, E. E. (1976). Behavioral measures of cutaneous sensitivity. *Society for Neuroscience Abstracts*, 2, 933.

Hollins, M., and Bunn, K. W. (1976). The effect of retinal eccentricity on convergence micropsia. *Bulletin of the Psychonomic Society*, 8, 253.

Hollins, M. (1971). Brightness contrast at low levels of luminance. Paper presented at the meeting of the Association for Research in Vision and Ophthalmology, Sarasota, Florida, April 26-30.